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PG ASST IN PHYSICS

Padasalai.Net's Special – Centum Coaching Team
Physics - Question Paper (2016-17)

CLASS : XII **MARKS : 150**
DATE : **TIME : 3.00 hr**

PART - I

Note : i) Answer all the questions: 30 x 1 = 30
ii) Choose and write the correct answer.

1. A glass rod rubbed with silk acquires a charge of $+8 \times 10^{-12}$C. The number of electrons it has gained or lost
   a) 5×10^{-7} (gained) b) 5×10^{7} (lost)
   c) 2×10^{-8} (lost) d) -8×10^{-12} (lost)
2. The work done in moving 500 μC charge between two points on equipotential surface is
   a) zero b) finite positive c) finite negative d) infinite
3. The unit of permittivity is
   a) $C^2 N^{-1} m^{-2}$ b) $N m^2 C^{-2}$ c) $H m^{-1}$ d) $N C^{-2} m^{-2}$
4. When a number of capacitor are connected in parallel between two points, the equivalent capacitance
   a) increases b) decreases c) remains the same d) none of the above
5. A wire of resistance 5Ω is drawn out so that its length is increased to twice its original length. The value of its new resistance is
   a) 5Ω b) 20Ω c) 15Ω d) 45Ω
6. Peltier coefficient at a junction of a thermocouple depends on
   a) the current in the thermocouple
   b) the time for which current flows
   c) the temperature of the junction
   d) the charge that passes through the thermocouple
7. An electron is travelling along the X direction. It encounters the magnetic field the Y direction. Its subsequent motion will be
   a) Straight line along X direction b) a circle in the X – Z plane
   c) a circle in the Y –Z plane d) a circle in the XY plane
8. Electromagnetic induction is not used in
   a) transformer b) room heater c) AC generator d) choke coil
9. The self–inductance of a straight conductor is
   a) zero b) infinity c) very large d) very small

10. The part of the AC generator that passes the current from the coil to the external circuit is

a) field magnet b) split rings c) slip rings d) brushes

11. A battery of 12V is connected to primary of a transformer with turns $\frac{N_s}{N_p}$ = 10.

Voltage across secondary would be

a) 120 V b) 1.2 V c) 12 V d) Zero

12. In an electromagnetic wave

a) power is equally transferred along the electric and magnetic fields
b) power is transmitted in a direction perpendicular to both the fields
c) power is transmitted along electric field
d) power is transmitted along magnetic field

13. In an electromagnetic wave the phase difference between electric field $\vec{E}$ and magnetic field $\vec{B}$ is

a) $\frac{\pi}{4}$ b) $\frac{\pi}{2}$ c) π d) zero

14. A diffraction pattern is obtained using a beam of red light. What happens if the red light is replaced by blue light?

a) bands disappear b) no change
c) diffraction pattern becomes narrower and crowded together
d) diffraction pattern becomes broader and farther apart

15. A ray of light falls on a transparent slab of $\mu = 1.0$. If reflected and refracted rays are mutually perpendicular, what is the angle of incidence.

a) 45^0 b) 60^0 c) 30^0 d) 90^0

16. According to Bohr's postulates, which of the following quantities take discrete values?

a) kinetic energy b) potential energy
c) angular momentum d) momentum

17. The elliptical orbits of electron in the atom were proposed by

a) J.J.Thomson b) Bohr c) Sommerfeld d) de Broglie

18. In hydrogen atom, which of the following transitions produce a spectral line of maximum frequency

a) $2 \rightarrow 1$ b) $6 \rightarrow 2$ c) $4 \rightarrow 3$ d) $5 \rightarrow 2$

19. The ratio of radii of orbits corresponding to first and second excited state of hydrogen atom is

a) 1 b) 1 : 2 c) 2 : 3 d) 4 : 9

20. The slope of frequency of incident light and stopping potential for a given surface will be

a) h b) $\frac{h}{e}$ c) eh d) e

21. The work function of a photoelectric material is 3.3 eV. The threshold frequency will be equal to

a) 8×10^{14} Hz b) 8×10^{10} Hz c) 5×10^{20} Hz d) 4×10^{14} Hz.

22. The nuclei $_{13}Al^{27}$ and $_{14}Si^{28}$ are example of

(a) isotopes (b) isobars (c) isotones (d) isomers

23. Nuclear fission can be explained by

a) shell model b) liquid drop model
c) quark model d) Bohr atom model

24. The radio-isotope used in agriculture is

a) $_{15}P^{31}$ b) $_{15}P^{32}$ c) $_{11}Na^{23}$ d) $_{11}Na^{24}$

25. Out of $_6C^{14}$, $_7N^{13}$ and $_8O^{16}$, the pair of isotones of

a) $_6C^{14}$, $_8O^{16}$ b) $_7N^{14}$, $_7N^{13}$ c) $_7N^{14}$, $_6C^{14}$ d) $_7N^{14}$, $_8O^{16}$

26. The gate for which output is high if atleast one input is low is

a) NAND b) NOR c) AND d) OR

27. In an N−type semiconductor, there are

a) immobile negative ions b) no minority carriers
c) immobile positive ions d) holes as majority carriers

28. The colour of light emitted by a LED depends on

a) its reverse bias b) the amount of forward current
c) its forward bias d) type of semiconductor material

29. Ground wave propagation is not saited for

a) high frequency signals b) low frequency signals
c) medium frequency signal d) none of the above

30. Printed documents to be transmitted by fax are converted into electrical signals by the process of

a) reflection b) scanning c) modulation d) light variation

PART – II

II. Answer any Fifteen questions : 15 x 3 = 45

31. What is corona discharge? What are its advantages?

32. Give any three properties of electric lines of forces.

33. Distinguish between emf and potential difference.

34. Name three changes observed at the transition temperature.

35. A 1.5 V carbon – zinc dry cell is connected across a load of 1000 Ω. Calculate the current and power supplied to it.

36. Define ampere interms of force between two long parallel current carrying conductors.

37. Acapacitor blocks dc but allow ac. Explain.

38. An a.c generator consists of a coil of 10,000 turns and of area 100 cm^2. The coil rotates at an angular speed of 140 rpm in a uniform magnetic field of 3.6×10^{-2}T T. Find the maximum value of the emf induced.

39. A 300 mm long tube containing 60 cc of sugar solution produces a rotation of 9° when placed in a polarimeter. If the specific rotation is 60°, calculate the quantity of sugar contained in the solution.

40. What are electromagnetic waves?

41. State Moseley's law.

42. Calculate the longest wavelength that can be analysed by a rock salt crystal of spacing d = 2.82Å in the first order.

43. If a body moves with the velocity of light, what will be its mass? Comment on result.

44. Define curie.

45. What are thermonuclear reactions.

46. What is zener breakdown?

47. What are the advantages of negative feedback?

48. Draw the circuit diagram for NPN transistor in common Emitter mode.

49 The gain of the amplifier is 100. If 5% of the output voltage is fed back into the input through a negative feed back network. Find out the voltage gain after feed back.

50. Define modulation factor.

PART - III

Note : i) Answer questions no 60 compulsory : 7 x 5 = 35

ii) Answer any six of the remaining 11 questions

iii) Draw diagrams wherever necessary.

51. Two point charges +9e and +1e are kept at a distance of 16cm from each other. At what point between these charges, should a third charge q to be placed so that it remains in equilibrium?

52. Explain the working of a Lchlanche cell with a diagram.

53. In a house, electric kettle of 1500 W is used everyday for 45 minutes, to boil water. Find the amount payable per month (30 days) for usage of this, if cost per unit is Rs. 3.25.

54. Explain how will you convert a galvanometer into an ammeter.

55. Explain the various energy losses. How are they minimized?

56. Distinguish between interference and diffraction.

57. Describe laue experiment. What are the facts established by it?

58. What is photoelectric effect? State the laws of photoelectric emission.

59. Derive an expression for de-Broglie wavelength of an electron.

60. The binding energy per nucleon for $_6C^{12}$ nucleus is 7.68 MeV and that for $_6C^{13}$ is 7.47 MeV. Calculate the energy required to remove a neutron from $_6C^{13}$ nucleus. **(OR)**

A reactor is developing energy at the rate of 32 MW. Calculate the required number of fissions per second of $_{92}U^{235}$. Assume that energy per fission is 200 MeV.

61. Deduce the relation between α and β of a transistor.

62. What are the different types of wire and cable used for telecommunication system?

PART - IV

i) Answer any four questions 4 x 10 = 40

ii) Draw diagrams wherever necessary:

63. State the principle and explain the construction and working of Vande Graaff generator.

64. Explain the detail the principle , construction and the theory of moving coil galvanometer.

65. A source of alternating emf is connected to a series combination of a resistor R an inductorL and a capacitor C. Obtain with the help of a vector diagram and impedance diagram, an expression for (i) the effective voltage (ii) the impedance (iii) thephase relationship between the current and The voltage.

66. Discuss the theory of plane transmission grating.

67. With the help of energy level diagram. Explain the working of He –Ne laser.

68. What are cosmic rays? Explain how the intensity of the cosmic rays changes with altitude and latitude.

69. Sketch the circuit of Colpitts Oscillator. Explain its working.

70. Explain the functional block diagram of monochrome TV receiver.

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மாணவர்கள் செய்ய வேண்டியது என்ன?

1. ***Click Here & Enter Your Details (Students Only)***
2. நமது பாடசாலை வலைதளத்தில் வழங்கப்படும் சிறப்பு வினாத்தாளை பிரிண்ட் எடுத்து விடுமுறை நாட்களில் முழுமையான, முறையான தேர்வு எழுதி வினாத்தாள் தயாரித்து வழங்கிய ஆசிரியருக்கு அனுப்பி வைக்க வேண்டும்.
3. A4 Size (Or) Legal Size உள்ள துணிக்கவர்கள் இரண்டு வாங்கிக்கொள்ள வேண்டும். ஒரு தாளில் வினாத்தாள் தயாரித்த ஆசிரியர் முகவரியை "பெறுநர்" பகுதியில் குறிப்பிட்டு அதில் தங்கள் விடைத்தாளை வைக்க வேண்டும்.
4. மற்றோரு கவரில் மாணவர்கள் தங்கள் சுயமுகவரியை "பெறுநர்" எனும் இடத்தில் எழுதி அதற்கு தேவையான அளவில் ஸ்டாம்ப்களையும் ஒட்டிய பிறகு, அக்கவரையும் விடைத்தாள் எழுதி அனுப்பும் கவருக்குள்ளேயே வைத்து அனுப்ப வேண்டும்.
5. ஒன்றுக்கும் மேற்பட்ட மாணவர்கள் இணைந்து விடைத்தாளை அனுப்பினால் மொத்தமாக ஒரே கவரில் அனுப்பலாம். ஆனால் ஒரு கவரில் மூன்று விடைத்தாள்களுக்கு மேல் இருக்கக்கூடாது.
6. ஆசிரியர்கள் தங்கள் விடைத்தாளை திருத்திய பிறகு தங்கள் சுயவிலாசமிட்ட கவரில் (Return Cover) வைத்து தங்களுக்கு விரைவில் திருப்பி அனுப்புவார்.
7. தங்கள் விடைத்தாளை உரிய ஆசிரியருக்கு அனுப்பி வைத்த தேதியிலிருந்து 3 வாரங்களுக்குள் தங்களுக்கு மீள கிடைக்காவிடில் இங்கு தரப்பட்டுள்ள "புகார் பதிவு படிவத்தில்" தங்கள் விவரத்தை பதிவு செய்யவும். **Click Here for Complaint Box!**
8. Slow Learners மீது மட்டும் கவனம் செலுத்தாமல் மீத்திறன் மிகுந்த மாணவர்களுக்கும் உதவும் நோக்கில், மாணவர்களின் நலன் கருதி, இச்சேவையில் தங்களை இணைத்துக்கொண்டுள்ள பாடசாலை ஆசிரியர் குழுவினை, மாணவர்கள் மிகுந்த பணிவுடன் தொடர்பு கொண்டு திருத்தப்பட்ட விடைத்தாள் குறித்த தங்கள் சந்தேகங்களையும், ஆலோசனைகளையும் அலைபேசி மூலமாக பெறலாம்.

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If any doubt, Please contact our Padasalai's Centum Coaching Team Co-ordinator:

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